

# Recruiting Secondary Mathematics Teachers: Characteristics That Add Up for African American Students

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*In this article, the authors provide portraits of three mathematics teachers: one European American man, one African American man, and one Middle Eastern woman. All three taught in secondary schools with predominantly African American student populations. Semi-structured interviews and observations were conducted to create a comparative case study that analyzed the teachers' "star" background experiences and skills (Haberman, 1995). The analysis also focused on whether or not there was a connection between their star background experiences and skills and their use of relational and field-dependent methods of teaching. Data suggest that there was a connection between Haberman's star framework and teachers who taught relationally and used field-dependent methods. Based on these results, the authors argue that alternative certification programs should broaden their criteria and recruit preservice teachers with star background experiences and skills.*

**KEYWORDS:** mathematics education, teacher recruitment, urban education

There comes a moment...where we have to discuss "The Black Issue"  
and what's appropriate education for Black children.

—Lisa Delpit, 1995

**A**t some point we have to address what is best for African American students. While *what* (content) we teach and *how* (pedagogy) we teach mathematics are definitely important, in this article, we seek to continue the conversation about *who* should teach mathematics to African American students. Martin (2007) raised this question and called for more research about mathematics teachers that

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emanated from the experience lens rather than the achievement lens. The experience lens gives a “face” to the teacher and allows for the teachers’ beliefs, experiences, knowledge, and dispositions to rise to the surface; while the achievement lens places an emphasis on the teacher’s credentials (Martin, 2007). The achievement lens may address the question of *who* is “qualified” to teach mathematics to African American students by mainstream standards, but it is the experience lens that addresses *what* qualifies them to teach mathematics to African American students. The experience lens informs the teacher’s instructional decisions and practices and how these decisions impact the teaching and learning of students.

### Researcher Positionality

As researchers who explore critical issues in mathematics teaching and learning, we believe that it is important to the research process to reveal (although briefly) our perspectives and experiences that inform, inspire, and motivate our work.

*Tamra*

I am a “biracial” woman who identifies as African American. I earned a bachelor’s degree in mathematics from a Historically Black College and University (HBCU), gained licensure through a master’s degree program at a predominately White institution (PWI), and achieved National Board Certification in Adolescence and Young Adulthood Mathematics. I taught high school mathematics for 13 years in the same urban district where I was a former student. As a teacher and instructional coach, I witnessed other teachers having difficulty teaching mathematics to African American students. I see the importance of credentials that deems one “highly qualified”; however, I also recognize that those credentials alone do not qualify a teacher to teach mathematics to African American students. I too often witnessed teachers, both Black and White, with strong content knowledge, little or no classroom management skills, and sometimes low expectations who could not develop professional-personal relationships with their students to make the classroom conducive to learning.

As a former mathematics teacher educator at a HBCU who prepared primarily African American students to teach secondary mathematics, I saw another problem. Too often students with high GPAs in mathematics content graduate without taking and/or passing the state licensure mathematics content examination (there is no requirement to take and/or pass the examination before graduation). While these students have the skills and disposition, they do not receive an initial teaching license, and have difficulty acquiring permanent teaching positions. Because there is no required test preparation course at the university, they too often

procrastinate and delay taking the examination until after they graduate. To address this void, a new required class was created to assist students with passing licensure requirements. Given the diverse student population at the university, there is a great opportunity to impact the diversity of the teaching profession in secondary mathematics if we can overcome this hurdle of too many students either not taking or not passing the state licensure examination.

*Shelly*

I am a White woman who taught middle and secondary mathematics in urban settings for 12 years prior to becoming a mathematics teacher educator. My research interest focuses on mathematics and social justice. For the past three years, I have participated in the revival of a grant program for college students of color who expressed an interest in teaching either mathematics or science. Before I began working with the program, over 20 students participated and only one of them graduated with a teaching license. Several of the students earned bachelor's degrees in education but did not pass the licensing examinations. For the past 3 years, I have worked with five students of color, four of whom have graduated, passed the licensing examinations, and secured teaching positions in urban school districts. Unfortunately, a disproportionate amount of mentoring time was spent on studying for the licensing examinations despite the fact that all of these students' GPAs in mathematics content courses and teacher education courses were above 3.25. Sharing similar research interests, I served on Tamra's doctoral dissertation committee.

## **Conceptual Framework**

### *Star Background Experiences and Skills*

Haberman (1995) argued that "star teachers" (p. 1) focus less on teaching the content standards and objectives and more on turning students onto learning. In fact, Haberman noted that only about 5 to 8% of teachers in schools entrenched with poverty are stars. Nearly 20 years ago, Haberman espoused the belief that teacher education programs should recruit candidates with star attributes and create immersion programs in urban school settings. According to Haberman, the recruitment and selection is more important than the training. Star teachers have background experiences that include many of the following: they are more than 30 years old; they are of color; they are parents or guardians; they have had military experience but not as officers; they live or have lived in urban areas; they majored in a field other than education as an undergraduate; and they have experienced living in poverty or can empathize with the challenges of living in poverty (Haberman, 2005).

Haberman and Post (1998) argued that too often urban children and youth of color “control the urban school’s agenda by making educators spend most of their time and energy reacting to street values rather than proactively implementing the stated curriculum” (p. 96). Star teachers, however, do not let “street values” dominate in their classrooms. They promote their students’ successes by creating communities of learners, not by threats of force or coercion, but rather by teaching students how to become self-empowered and to take control of not only their classroom behavior but also their learning (Haberman, 2008). According to Haberman (as cited in Ladson-Billings, 2001, p. 80), the best teachers for poor children use these specific skills:

- Protect learners and learning,
- Put ideas into classroom practice,
- Challenge external labels given to students (e.g., “at-risk”),
- Develop a professional-personal orientation toward students,
- Satisfy school bureaucracies without comprising teaching quality,
- Recognize their own fallibility,
- Have emotional and physical stamina,
- Have good organizational ability,
- Focus on student effort rather than a vague notion of ability,
- Focus on teaching students rather than sorting them,
- Convince students that they are needed in the classroom, and
- Serve as allies with students against challenging material.

#### *Relational and Field-Dependent Teaching Methods*

Hale (1982) asserted that social class and ethnicity shape cognitive style, and that children learn their cognitive style through family socialization. African American children tend to employ a relational cognitive style and schools tend to value an analytical cognitive style (Bonner, 2000; Hale, 1982). African American students, therefore, tend to be more dependent on their relationships with teachers than other races (Irvine, 2009); that is to say, they more often than not need to establish positive affirming and caring relationships with teachers. Furthermore, African American students’ learning styles are typically field-dependent while learning styles for White students are typically field-independent (Shade, 1994). People who reason analytically and sequentially are field-independent thinkers whereas people who reason holistically, simultaneously, or relationally are field-dependent thinkers (Malloy, 1997; Shade, 1994). It is important to note that field-dependence and field-independence characterize learning styles and behaviors, but they are not mutually exclusive to race or ethnicity (Shealey, Lue, Brooks, & McCray, 2005). Additionally, learning style is “not a psychological trait but a dy-

namic state resulting from synergistic transactions between the person and the environment” (Joy & Kolb, 2009, p. 71).

Stiff and Harvey (1988) claimed that “field-independent teaching and learning styles value analytical thinking and systematic approaches to problematic situations...what one finds is that school mathematics and the manner in which it is delivered are in opposition to the communication and learning styles of Black Americans” (pp. 196–197). Effective culturally responsive teachers of Black children, therefore, not only acknowledge the cultures, backgrounds, and strengths of their students but also they utilize students’ learning styles (Gollnick & Chinn, 2009).

To recap, African American children most often are socialized in their families to be relational in cognitive style and field-dependent learners. Therefore, mathematics instructional practices for field-dependent learners should include holistic approaches, cooperative environments, intuitive thinking opportunities, and informal discussions (Malloy & Malloy, 1998; Morgan, 2009; Sadler-Smith, 1999; Saracho, 1991; Slavin & Oickle, 1981; Stiff, 1990). Teachers who provide positive feedback to students in secondary mathematics courses may encourage field-dependent students’ achievement (Adegoke, 2011). In general, research suggests that teachers who employ the above methods, which value relationships and field-dependent learning, validate the actions and cognitive styles of African American students.

## **The Study**

### *Purpose*

This study is based on interviews and observations with three secondary mathematics teachers who taught in urban secondary schools. The purpose of this study was to analyze the teachers’ star background experiences and skills (Herman, 1995). Additionally, the study focused on whether or not there was a connection between the teachers’ star background experiences and skills with regards to their use of relational and field-dependent methods of teaching. The following three research questions guided the study:

1. What star background experiences have the teachers had?
2. What star teaching skills do the teachers use?
3. What connections emerge between star background experiences and teaching skills and instructional methods focused on relational learning styles and field dependency?

### *Research Design*

According to Patton (2002), “the purpose of the case study approach is to gather comprehensive, systematic, and in-depth information about each case of interest” (p. 447). Thus, we used a case study approach to gather information about the three teachers. We first examined each teacher as an individual case. Then, we conducted a collective case analysis (Creswell, 2012) to provide insight into teachers’ star background experiences and skills with regards to relational and field-dependent teaching methods.

### *Participants and Sampling Procedures*

The school district in which the participating teachers were employed was located in a mid-size metropolitan city in the mid-western region of the United States. A purposeful sampling method was used to select participants. The intent was to select a diverse but small group of mathematics teachers for maximum variation (Creswell, 2012). To achieve this variation, the participants needed to meet the following criteria: (a) possess unique race, ethnic, and/or gender identities; (b) teach mathematics at different grades levels; and (c) had earned their teaching licensure through an alternative route.

The first author identified three participants whom she knew personally and who met all the criteria, invited them to participate, and they, in turn, accepted. The only consistency among the participants was that they all took a non-traditional or alternative route to licensure and taught in the same urban school district. After achieving minimal consistency, we looked for variability. We wanted to see, given the variability, how each teacher’s case study uniquely aligned to the literature. Our three teachers were: Grant, Hayden, and Wisnewski (pseudonyms).

### *Data Collection*

*Teacher interviews.* The first author interviewed each teacher twice during the study. The first semi-structured interview was designed to learn about the teachers’ background experiences and their beliefs and philosophies about education and teaching. All interviews were audiotaped and transcribed. Each interview lasted 45 to 60 minutes. The second interview was conducted after the classroom observations (described below) were completed. This second interview was open-ended and its purpose was to have the teachers clarify instructional strategies observed and to give each teacher the chance to describe his or her teaching style, strategies, and teaching behavior. Field notes from the observations drove the development of questions to be asked of each teacher for the second interview.

*Classroom observations.* In addition to the two interviews of each teacher, the first author conducted five observations of each teacher interacting with his or her students. The first author entered the room before the start of each class period to be observed to minimize altering or interrupting the classroom routine. Field notes were taken to capture student–teacher conversations and interactions.

### *Data Analysis*

We immersed ourselves in the data by reading and re-reading interview transcripts and field notes from the observations. We continually referred back to the star background experiences and teaching skills as *a priori* categories to document evidence from the data that might align with these categories. Table 1 shows an example of one of the tables we created for one of the teachers, Grant, in our study. In Table 1, we listed the star teacher skills, the date the data were collected, the source (observation or interview) of the data, and the page number(s) of the source. The tables for each teacher assisted in determining how the data supported (or not) our findings.

*Table 1*  
**Grant's Evidence of Star Teaching Skills**

Teaching Skill	Date	Source	Page
Protect learners and learning	3-12-08	Observation 4	p. 2
		Interview 2	p. 5–6 (I try to hinder...)
Put ideas into practice		Interview 2	p. 1 (PD)
Challenge external labels		Interview 2	p. 3 (not out of same mold)
Develop professional-personal relationships		Interview 2	p. 3 (tie the mainstream with a little ghetto)
Satisfy school bureaucracies		Interview 2	p. 3 (follow the rules but...)
Recognize own fallibility		Interview 2	p. 3 (be more creative)
Have emotional and physical stamina		*	
Possess good organizational skills		*	
Focus on student effort	3-11-08	Observation 3	p. 2 (all can learn ...at different pace)
Teach students rather than sort		Interview 1	
		Interview 2	p. 5 (everybody has unique attributes)
Convince students they are needed	3-5-08	Observation 3	p. 3
		Interview 2	p. 7 (some things I can't get across to them, but their friends can)
Serve as allies <i>with</i> students	3-5-08	Observation 1	p. 1–2
		Interview 2	p. 8–9 (word walls ... language)

\* Evidence from professional experiences with Grant.

Next, we totaled the number of experiences and skills for each participant. Then we compared the participants' background experiences and skills to the extant literature related to relational or analytical cognitive styles as well as field-dependent and field-independent learning styles.

### *Validation of the Findings and Delimitations*

We had numerous researcher meetings to discuss our interpretations. Additionally, we shared drafts of our analysis with colleagues in teacher education programs at two other universities. These colleagues provided feedback and furthered our discussion about our interpretations to validate our findings.

We do not claim that the findings are generalizable because the data are from only three teachers. Furthermore, the teachers were selected from one school district, and the first author knew all three personally prior to the study. The teachers were chosen in a type of purposeful sampling method (Creswell, 2012); each had diverse background experiences before and after he or she became mathematics teachers.

## **Findings**

### *Teachers' Background Data*

In Table 2, we summarize the individual teachers' demographic data collected during the interviews. What follows are individual descriptions of the teachers' backgrounds and two additional tables in which we summarize their star background experiences (Haberman, 2005) and star skills (Haberman, 1995) in Table 3 and Table 4, respectively.

*Table 2*  
**Teachers' Demographic Data**

<b>Demographic</b>	<b>Grant</b>	<b>Hayden</b>	<b>Wisnewski</b>
<b>Gender</b>	Male	Female	Male
<b>Race and/or ethnicity</b>	Black	Iranian	White
<b>Years teaching</b>	17 years (urban)	20 years (urban)	29 years (urban)
<b>School type</b>	Middle School	High School	High School
<b>Subject/grade</b>	Mathematics 8th grade	Algebra II 11th grade	Precalculus 12th grade
<b>University training</b>	Public, HBCU	Public, PWI	Private, Catholic
<b>Undergraduate degree</b>	Business Education	Engineering/ Mathematics	Mathematics



*Grant.* Grant was a 51-year-old, male African American who had been teaching mathematics for 17 years at the time of the study: 14 years at the high school level and 3 years at Great River Middle School. He came from a family of educators who also had worked within the same school district. Grant grew up in the city where he taught and also had graduated from a local high school. His ties to the district were strong because of his family, and he was still living in the community. Grant attributed his father with introducing him to teaching at an early age because his father allowed him to coach 10-year-old children in a tennis program for inner-city youth. Although he admitted to being a “horrible student,” Grant attended a HBCU and earned a business education degree. After graduation, he became a long-term substitute teacher for 2 years at a high school and then decided to join the army. While in the army, he became an ammunitions specialist. He trained military personnel to use firearms and ammunition using “a little math.” After military service, he took courses at a local university and received a mathematics certification and his master’s degree in education. Within 2 years, he completed a second master’s degree in education administration from the same university.

*Hayden.* Hayden had been a high school mathematics teacher for 20 years. She was originally from Iran and left there when she was 16 years old due to the political and religious unrest at the time of the Khomeini regime. She was very close to her sister who also taught mathematics. When she started college, she majored in engineering with a geology option. Her intent was to return to Iran and “make lots of money,” but she married an American. Her engineering profession required traveling, which her husband did not like, so she went back to school to pursue a degree in mathematics. While pursuing this degree, she tutored mathematics majors, and her tutees suggested that she become a mathematics teacher because she was “really good at helping them understand it.” Over the years, Hayden developed a reputation for helping her students pass the AP Calculus exam. She reported that she had seven AP Calculus students at the time of the study.

*Wisnewski.* Wisnewski had been a high school mathematics teacher for 29 years and worked the last 23 years in the same building while serving as the department chair. He admitted that he majored in mathematics because he liked it in high school and did well. Instead of asking the teacher for help, several of his classmates often asked him for help. While in college, his roommate and other friends asked him for help with calculus. Although he graduated with a mathematics degree, Wisnewski did not consider the teaching profession. After graduation, he worked in a furniture warehouse for five years. He decided to become a teacher because he wanted to do “something worthwhile” and he attended the university where he earned his undergraduate degree to pursue a Master of Science in Teaching degree. He started teaching after completing his student-teaching assignment within this same district.

*Teachers' Star Background Experiences*

Table 3 illustrates the star background experiences of all three teachers: Grant, Hayden, and Wisniewski. Based on the interview data, we summarize the attributes that Haberman (2005) noted star teachers typically share and predict their effectiveness and retention in schools serving poor minority students.

*Table 3*  
**Star Background Experiences**

<b>Experience</b>	<b>G</b>	<b>H</b>	<b>W</b>
<b>1. More than 30 years of age (when started teaching)</b>	No	No	No
<b>2. Parent or has extensive relationships with children</b>	No	Yes	No
<b>3. Had military experience but not as an officer</b>	Yes	No	No
<b>4. Lived in a metropolitan area</b>	Yes	Yes	Yes
<b>5. Majored in a field other than education as an undergraduate</b>	Yes	Yes	Yes
<b>6. Experienced living in poverty or can empathize with the challenges of poverty</b>	Yes	Yes	No
<b>7. Attended schools in a metropolitan area</b>	Yes	Yes	No
<b>8. Had out-of-school experiences with diverse children</b>	Yes	Yes	No
<b>9. Earned a bachelor's degree from a non-highly selective or non-elitist university</b>	Yes	Yes	Yes
<b>10. Had extensive work experience before teaching</b>	No	Yes	Yes
<b>11. Engaged in paid or volunteer activities with diverse children</b>	Yes	Yes	No
<b>12. Multitasks quickly or for extended periods (e.g., parenting and working part time)</b>	Yes	Yes	No
<b>13. A member of a minority group or working class family</b>	Yes	Yes	No
<b>14. Lived in a city or would move to the city for residency requirement</b>	Yes	No	No
<b>15. Part of family/church/ethnic community in which teaching is still regarded as a high status career</b>	Yes	Yes	No

**Key:** G = Grant; H = Hayden; W = Wisniewski

*Teachers' Star Skills and Teaching Methods*

*Grant.* Grant typically started class with a bell ringer (a released item from the state achievement test), which students were expected to complete within the first 10 to 15 minutes of class. He then explained the expectations for the day and mentioned the mathematics standard and benchmark that was written on the whiteboard. Afterwards, he moved into whole group instruction for about 20 minutes and then gave similar exercises for the students to solve in their groups. Grant wanted his students to respect each other enough to listen to what each had to say. When students asked him a question, he responded with, "What did your

teammate say?" Or, if a group member made a plausible argument, he encouraged the other group members to take heed. He knew that his students needed to become better problem solvers and less dependent on him for answers. Thus, he wanted them to believe in themselves enough to find an answer and convince the other group members:

*(One student asks Mr. G a question.)*

**Mr. G:** What did your group members say? What do you think? Well why aren't you sticking up for your own thoughts?

*(Mr. G moves to next group. There's a lot of loud conversation between group members.)*

**Mr. G:** Y'all need to listen to him (points to one student). He explained what y'all was tryin' to find.

**Students:** Aren't we going to find area?

**Mr. G:** Did they say area? What did they say?

*(Mr. G continues to make his way around the room to check on other groups.)*

**Mr. G:** *(To group in back)* Y'all straight? *(He turns to other group in front with same problem.)* I don't know why they got it and y'all didn't. They ain't no smarter than you are. Some of y'all clown too much but you can solve it.

Grant allowed students to work in groups even though he did not like the loud noise that usually occurred. He admitted, however, that he used peer groups because the students learned more from each other than they did from him. He believed all of his students were capable of learning mathematics and could be successful but the key, for him, was getting the students to believe in themselves:

I believe that all kids can learn. They might learn at a different pace. Some may not really try. They don't see the benefits education can afford in life and so I try to be an agent of change in their attitude and get them to understand why education and learning is so important.

One way he accomplished this change in attitude was by using out-of-school experiences and connections to the students' lives to support the mathematics content. He artfully told stories and admitted that he sometimes told "white lies" if he could somehow relate a real-world experience to what was studied in class. For example, during one lesson he used going to the store as the context of a problem. He frequently used the students' language, Black English vernacular, but not in a condescending way. For example, when a student did not explain the process of finding a solution using "standard" English he said, "I know what you are trying to say, but those test graders in 'North Cackalacky' [his reference to North Carolina] don't know so we need to use proper English," or when he checked for understanding he would say, "Y'all wit me? Are we here?" moving his finger back and forth between himself and the students. He acknowledged that

his two all-male classes and one mixed-gender class were comprised of African Americans and a few Latinas/os who were into sports so he made sports references when they were relevant. He also took students to an NBA basketball game every year:

I take them out on the floor. They can see the scorekeeper. ... These guys make over \$100,000 for sitting, checking the period of averages, who has the most rebounds. All that's math. The ticket takers...scanners for people who enter the game. There are numbers involved in that. They have to post attendance of every game for the newspapers. ... To express the importance... what type of education you need for that and that sort of thing. The camera men... because most of our kids see, all they see is the basketball players.

Grant was known to be a disciplinarian and whom students perceived as "mean." His classes were "well-behaved." He grew up attending segregated schools—with Black children and Black teachers—and when he went through school it was a family-like atmosphere, with direct instruction, and a lot of discipline. He described himself as a horrible student. When younger, he saw how his father exhibited understanding and compassion, along with a healthy dose of tough love. Grant said he adopted the same strategies. During a parent-teacher conference, one student said, "Mr. Grant, he too mean. He so mean he make me do my work."

He noted how he and his students worked out behavior and academic problems among themselves. He may have given students a piece of his mind, but the students knew Grant had their backs and would be there for them. Most discipline he handled in house rather than referring students "to the system" (e.g., sending them to the principal's office). He admitted that he did not always articulate his discipline lectures with political correctness, but the students appreciated his care in not writing them up for discipline referrals.

Grant allowed for plenty of discussion and conversation about topics that were school related but was willing to entertain non-school related topics as well. He understood that some of his students came to school with more "street knowledge" than "school knowledge"; thus, he used their knowledge to bridge and share knowledge between himself and his students. He acknowledged differences and diversity among his students. He said, "Everybody brings unique attributes [to the classroom]." He thought students learned in different ways and at different paces. He had a different definition of successful teaching of African American students, and believed that if he could get a student to try a math problem, he had succeeded. He said:

I don't look at success as A, B, C, D, or F. If I could just get my students to try to learn something, even if they are not successful the first time, they could learn from their mistakes. *As long as I get them to try, I am having some type of success.*

He thought that his students needed as many experiences as possible and looked for any possible means for success.

As illustrated in Table 4, Grant displayed 10 star skills during his classroom instruction and interviews. Grant's teaching focused on building relationships and encouraging his students to think holistically by using field-dependent teaching strategies. He did this by using cooperative groups (Slavin & Oickle, 1981) for students to engage in discussion (Shade, 1994). He valued the benefit of the group and encouraged cooperation among all parties in order to complete the tasks. He respected and had knowledge of students' lives, culture, and experiences and used this knowledge in instruction (Malloy & Malloy, 1998). He validated his students by using their language and their experiences as the social context to teach mathematics (Berry, 2008; Stiff & Harvey, 1988; Sheppard, 2011).

*Hayden.* Hayden taught in a school where the "arts came first and the academics came second." Some of her students were extremely talented in art, dance, or music, but she encouraged her students to pursue careers in mathematics rather than the arts. She told them with a career in mathematics they "may not make a million dollars, but they won't sleep in the streets." She typically presented new material at the beginning of class and if there was time she walked through each row talking to each student as she passed. Some of her comments were related to the work they were doing; some were not. If a student had a question, she answered it and then moved to the next student. Sometimes she just stopped and looked at their papers, and if she noticed a mistake, she would point it out to them:

- Ms. H:** *(to a girl)* I know this is your favorite *(pointing to a polynomial long division paper)* but you have to do this too *(moves polynomial long division paper and puts another paper on top)*. After a while this become your favorite too.
- Student:** I know. *(Student smiles)*
- Ms. H:** *(to a boy)* Where your graphing calculator?
- Student:** Somebody stole mine.
- Ms. H:** Hun, what about you, you don't ask me any question.
- Student:** I don't have any.
- Ms. H:** Let me see—come on, let's sit together.

She turned and moved toward her desk and the student followed her. Individual students or students in small groups approached her desk and sometimes she asked students to assist other students at her desk:

You should not be so egoistic and sometimes understand that kids understand from other kids better. Sometimes when I see a kid who explain really well, I say, "Wow, she explains really good." So I encourage the kid to explain to other kids...whatever works for them.

If students were late to class she reprimanded them. However, there seemed to be an understanding that if they had to get a drink or use the restroom, they could do these things without permission. She rarely had discipline problems.

She believed all of her students could succeed and that it was her job as a teacher to “turn the light on” for her students. She gave them encouragement and a healthy dose of tough love: “Just keep teaching them harder and be hard on them and make them be the best that they can possibly be. And don’t let them say they can’t learn this, or they can’t do this.” She viewed their academic achievement as an opportunity to overcome their circumstances:

We shouldn’t make them feel that they are different than the White or the yellow or the Japanese. They come to our classroom and they should be learning and you have every chance to succeed. You have every chance to become whoever you want to be. We owe them that much. We have to make them feel that way, because they can go home and feel miserable. I always tell them that a mind is a beautiful thing. It really is. There is no price you can put on when you have a good thinking process. You can do such a beautiful problem and later on you can get a good job. You can do a lot of things.

Hayden saw herself as a part of her students’ families. She thought all teachers were extensions of students’ families because teachers touched students’ lives and served as role models:

My life is not a secret. They ask me a lot, I share a lot of things about myself, because somebody who teaches them, somebody who’s with the kids, they think you become family, because whether we like it or not we are touching their lives. Like maybe they say that in 10, 15 years, I want to be like Mrs. H. I want to have two kids. I want to be like her.

Hayden respected the knowledge her students brought to school. She learned from them, and they learned from her. She admitted she was not aware of Black–White racial issues when she arrived in this country, but her students had shared their experiences with her and she could relate. In her native country of Iran, there were not racial issues per se, but there were issues regarding gender and social class. She said, “If you go to Middle East, rich people have better lives. They don’t have Black and White issues, they have, where is the money...our job is to teach them to rise above that.”

She acknowledged that she had an accent that became thicker when she was excited and talked fast. She knew her students did not always use standard English, but admitted she did not use it either. However, she wanted to know what her students were saying, and how they were saying it. Therefore, she asked them to explain their language to her. It was evident that she was passionate about mathematics and teaching. When students told her that they wanted to major in math-

ematics when they went to college, she became excited. When she explained how to use the equation to find  $h$ ,  $k$  and the foci so the students could graph an ellipse, she asked them, “You see the beauty in this?”

As illustrated in Table 4, Hayden displayed 11 star skills during her classroom instruction and interviews. Hayden’s teaching focused on building relationships with her students where she specifically thought of herself as a member of their family. She supported field-dependence by giving students straightforward problems and provided immediate individual feedback (Stiff & Harvey, 1988) for the entire class by walking through the classroom and examining students’ work after she explained the exercises. She assisted students with questions, and when those students used correct procedures, she asked them to help others. By encouraging this collaborative effort, she promoted a sense of security and interdependency within the classroom (Stiff & Harvey, 1988). She respected and had knowledge of students’ lives, culture, and experiences (Malloy & Malloy, 1998) and encouraged students to overcome negative experiences by presenting mathematics concepts as both powerful and beautiful.

*Wisnewski.* The first day in Wisnewski’s classroom, a student, Bianca, introduced herself as the next political star. The class had 23 students and they were noisy. After the bell rang, there were students out in the hallway knocking on the door. As the late seniors walked in, Wisnewski said, “Minus 2, minus 4, minus 6,” marking students’ tardiness. He shut the door and soon after another late student knocked on the door. He told her to come in and he admonished her for being late.

He started his lecture by talking about transformations of periodic functions and over the next 5 days he taught and re-taught how to identify a dilation, horizontal shift, vertical shift, and period of a function using equations and graphs.

He worked through each exercise step-by-step because, it seemed, he assumed his students did not know what to do to solve the exercises on their own. Wisnewski wrote  $h(x) = -6 \sin(10x - 2)$  on the board and asked:

**Mr. W:** What is the amplitude?

**Students:** Six.

**Mr. W:** Remember amplitude is the same as dilation. Remember to factor out 10.

**Student:**  $n/5$ .

**Mr. W:** Right,  $n/5$ .

(He wrote  $h(x) = -6 \sin 10(x - n/5)$  on the board, which was incorrect.)

**Mr. W:** I know it’s not the pre-calculus stuff that causes you problems; it’s the fractions stuff. The fifth grade stuff.

A formal teacher–student relationship existed in his room. He was the authority and he had the knowledge to be dispensed through lecture and no one challenged him. After the lecture, students on the left side of the room worked quietly on problems individually while students on the right side of the room formed

pairs or groups. One group on the right side of the room, comprised of six girls, lined their desks up together in the front of the classroom. They loudly debated back and forth about how to draw the graph, shared their notes, and looked at each other's solutions. When the girls could not agree on a solution they asked Wisniewski to settle the disagreement about the problem. However, he spent more time with the quiet students working independently than he did with the students who worked in small groups. He seemed to connect with certain students while he walked around the classroom answering questions and collected homework at the beginning of class. The same students often asked him questions and interrupted him during his lectures. However, he did not get upset when students interrupted him even though, at times, he could not finish a sentence. Wisniewski said that he "believes that all students can learn," but admitted:

an awful lot of kids nowadays with a background that is unbelievably bad...it seems to me that if they are weak in understanding such basic things that it is really somewhat unrealistic to get them to think at a higher level, if they have not mastered the basic skills.

He did not think that it was realistic for students with a "low-level" mathematics background to expect to pass the graduation test in high school if they did not pass previous tests in elementary grades. It bothered him that high school teachers were blamed when this happened. He saw his students as having "life and death experiences that suburban kids haven't had" and a lot more going on outside of school than suburban kids such as taking care of younger sisters and brothers, and jobs. He noted, "a teacher should not assign much homework because if the student does not complete it in school, it will not get done." He did not attempt to make connections with mathematics to the students' lives or acknowledge attributes of African American culture except for imitating their speech. He said, "you know like they may say, I don't understand, and I'll come back with, I know why you not be understanding 'cause you not be doing homework, and they'll laugh at that and say, yeah, yeah, I know I need to be doin' my homework." He said that his students were:

too social for cooperative learning groups and are highly likely to get off task. I don't see enough kids who are really good enough maybe to help the other kids. ...I just see them getting off task too easily and again the goal seems to be the social interaction and not the concept I am trying to teach.

Wisniewski did not seem to believe his students to be capable and knowledgeable about mathematics. He did not appear to understand how they learned or what knowledge they brought with them to the classroom. His conception of knowledge was very analytical and linear. He noted:



I think that these kids are more dependent on the teacher and each other. Simply for one reason, they don't have the general background because they don't do much outside of school. The White suburban kids, they are more likely to do their homework outside of school, they are more likely to get parental support, go to the library, and get the research done. This needs to play a much bigger role with inner city or African American students.

As illustrated in Table 4, Wisnewski used or described his use of four star skills in interviews. He used three additional star skills but only with some students and not with all students. Wisnewski's teaching did not support his students to be field-dependent thinkers. He did not support students working in collaborative groups, even those who grouped themselves. He saw their dependence on each other and on him as a problem that came as a result of their limited background. He saw their culture and life experiences as having little value. For the most part, Wisnewski taught his class as if they were field-independent learners by encouraging students to "focus on detail and use sequential/structured thinking...focus on the task, learn from formal lecture, achieve individually, and emphasize facts and principles" (Malloy & Malloy, 1998, p. 251). He was frustrated by his students because he taught the same skills repeatedly. Perhaps his frustration came as a result of repeated attempts to teach field-dependent learners with field-independent strategies.

#### *Summarizing Teachers' Star Skills and Teaching Methods*

All three teachers readily admitted that they were not "prepared" specifically to teach African American students in urban settings during their teacher preparation programs. Wisnewski, however, had an African American cooperating teacher and student-taught in this same urban district. But both Wisnewski's and Hayden's introduction to African American culture was on-the-job training. It was while working with other African American teachers and principals that they learned more about their students.

Wisnewski admittedly did not use African American culture in his class. He clearly saw deficits, not differences, and thought that his students could not learn what he was teaching until they learned the "lower-level" mathematics first. To connect to her students, Hayden used examples of African American mathematicians in her class, among other things. And Grant used real-world examples to teach mathematical concepts, among other strategies, to connect to his African American students.

As illustrated in Table 3 Grant and Hayden met 12 out of 15 of Haberman's (1995) star background experiences while Wisnewski met only 4. When we combined the results of Haberman's star background experiences (before they started teaching) and star teaching skills (after they started teaching), we had a clearer picture of which of these teachers' skills supported relational and field-dependent

methods in teaching mathematics to African American students. In fact, as illustrated in Table 4 Haberman's background characteristics aligned to the teachers' star skills and teaching methods prior to their teaching.

*Table 4*  
**Summary of Star Teaching Skills**

Teaching Skill	G	H	W
Protect learners and learning	Yes	No	Yes
Put ideas into practice	No	Yes	No
Challenge external labels	Yes	Yes	No
Develop professional-personal relationships	Yes	Yes	*
Satisfy school bureaucracies	Yes	Yes	Yes
Recognize their own fallibility	Yes	Yes	No
Have emotional and physical stamina	Yes	Yes	Yes
Possess good organizational ability	No	Yes	Yes
Focus on student effort	Yes	Yes	No
Teach students rather than sort	Yes	Yes	*
Convince students that they are needed	Yes	Yes	No
Serve as allies <i>with</i> students	Yes	Yes	*

**Key:** G = Grant; H = Hayden; W = Wisnewski

\* Yes and No, because yes with only some students

### Implications for Alternative Licensure Programs

Perhaps, teacher recruitment for alternative programs should go beyond analysis of GPAs and the passing scores on teacher licensure exams; this is especially true when disproportionate numbers of minority students fail content licensure exams in mathematics (Goldfaber & Hansen, 2010; Tyler, et al., 2011). Furthermore, the study conducted by Goldfaber and Hansen (2010) claimed that "replacing the failing Black teacher with a passing White teacher considerably decreases student outcomes" (p. 245). What are the implications for alternative teacher licensure programs such as Teach For America (TFA, 2013), Math for America (MFA), and the Woodrow Wilson Teaching Fellowship (WW)? These programs seek to take bachelor's degree holders and turn them into teachers. MFA (2013) and WW (2013) place their emphases on GPAs and Praxis II test scores for entry into their respective programs; such an emphasis is an achievement lens focus on teaching (Martin, 2007). TFA, however, places less emphasis on the GPAs, the minimum being a 2.5, but more emphasis on skills or characteristics that cannot be measured by GPA or Praxis II (such as skills outlined in Table 1). These characteristics provide a holistic look at the teacher candidate, just like Haberman's (2005) background experiences criteria. Applying Haberman's

fifteen attributes to each of these programs' self-reported selection criteria, only TFA comes close to using what could be called an experience lens focus (Martin, 2007) approach to prospective teacher selection. While Haberman's star background experiences alone may not guarantee success, teachers with these experiences along with star skills may likely be more effective in teaching African American students in mathematics.

## Conclusion

There is an additional richness and depth to teacher qualifications and characteristics researched by Haberman (1995, 2005, 2008), Ladson-Billings (1990, 1994, 1995a, 1995b, 1997, 2001), and others. This past research should not be overlooked today as old or outdated because it is crucial for the education of all students, particularly African American students, that teachers understand their students and are prepared to teach them. With the student population becoming increasingly more diverse, especially in urban areas (Snyder, 2008), it is critical that teachers be prepared to teach differences without labeling the differences as deficits. Based on our findings, more research is needed that focuses on the recruitment of teacher education. Perhaps alternative licensure programs should attempt to recruit mathematics teachers with an equal focus on both the experience lens and the achievement lens (Martin, 2007) to teach African American students. Additionally, we wonder what impact and power recruiting preservice teachers with star background experiences (Haberman, 1995, 2005) into traditional teacher education programs might have on preservice teachers without these experiences.

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